

**THE IMPACT OF DEMOGRAPHIC
CHARACTERISTICS ON VISITORS'
MOVEMENT AND CONGESTION IN AN URBAN
PUBLIC PARK**

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UNIVERSITI SAINS MALAYSIA

2020

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PUBLIC PARK**

by

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**Thesis submitted in fulfilment of the requirement
for the degree of
Doctor of Philosophy**

December 2020

ACKNOWLEDGEMENT

First and foremost, I would like to express my deepest thanks to Allah, the Almighty, the Most Gracious, the Most Merciful for all his blessings; health, wisdom, strength, and patience throughout this adventurous, exciting, and challenging journey.

I would like to express my profound appreciation to my main supervisor, Prof. Dr Aldrin Abdullah for his generosity and patience to his review, comments, and thoughtful suggestions to improve this thesis, and my co-supervisor, Prof. Dr Narimah Samat, for her insights, words of encouragement and the belief she always has in me. I am forever grateful to have met and been allowed to work with them.

Special thanks to my family members for their endless support, and prayers. My sincere gratitude goes to my husband “thank you for being beside me throughout these years”. I will always treasure your love, support, and hard times we faced throughout this journey.

I also would like to acknowledge my fellow USM colleagues studying in the PhD room, who shared their knowledge and expertise with me during the completion of my thesis. Many other people have assisted me but have not been mentioned here.

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KESAN CIRI-CIRI DEMOGRAFI TERHADAP PERILAKU GERAKAN PENGUNJUNG- PENGUNJUNG DI DALAM TAMAN AWAM BANDAR

ABSTRAK

Tingkah laku pergerakan pengunjung-pengunjung di taman-taman dikemukakan dalam pelbagai ekspresi dari perspektif dan faktor penyebab yang berbeza. Kekurangan pengetahuan berkenaan peranan ciri-ciri demografik pengunjung-pengunjung taman awam di bandar dan kurangnya pengetahuan dalam menentukan corak corak pergerakan dan trek yang paling kerap diguna telah menjurus kepada pengezonan kawasan yang tidak betul. Natiujahnya, akan ada kawasan-kawasan taman yang sesak, terabai dan berlakunya pemisahan dan pengasingan di kalangan pengunjung. Kesusakan dan penggunaan melampau kawasan taman awam bandar boleh menjejaskan persekitaran semulajadi di dalam taman tersebut. Konflik antara pengunjung-pengunjung taman mungkin mempengaruhi rancangan-rancangan rekreasi mereka, termasuklah aspek pemilihan aktiviti, laluan dan masa yang di habiskan di dalam taman. Tujuan utama kajian ini adalah untuk mengkaji tingkah laku pergerakan pengunjung -pengunjung di dalam taman awam bandar. Bagi mencapai tujuan tersebut, kajian ini mempunyai beberapa sub-objektif: 1) Untuk mengenalpasti ciri-ciri demografi pengunjung taman awam bandar, aktiviti-aktiviti yang dilakukan dan jumlah masa yang dihabiskan di dalam taman. 2) Untuk mengenal pasti laluan-laluan yang sesak dan terabai berdasarkan kepada pilihan pengunjung dan pergerakan rawak di dalam taman. 3) Untuk mengkaji perhubungan diantara ciri-ciri demografik pengunjung taman awam bandar, laluan, dan corak-corak pergerakan di dalam taman. 4) Untuk mengemukakan cadangan mengenai tingkah laku pergerakan pengunjung, yang membantu konservasi persekitaran taman dan menghasilkan pengalaman rekreasi

yang positif. Kajian ini telah di jalankan di Taman Belia, Pulau Pinang, Malaysia (juga dikenali sebagai Taman Perbandaran Pulau Pinang-Malaysia). Satu metodologi pelbagai telah digunakan untuk mengumpulkan data, di mana data kualitatif dan kuantitatif dikumpulkan secara serentak. Secara kualitatifnya, beberapa kaedah telah digunakan dengan 154 kumpulan pengunjung untuk mendapatkan maklumat yang berbeza mengenai corak-corak pergerakan, pilihan jalan dan laluan mereka, kesesakan, dan pergerakan rawak, yang telah dijelajahi melalui pemerhatian dan pengesanan peta. Corak pergerakan pengunjung ini diterokai melalui kaedah melukis dan seterusnya dianalisa menggunakan program GIS. Secara kuantitatifnya, satu soal selidik tinjauan telah digunakan untuk mengenal pasti ciri-ciri demografik, pilihan aktiviti-aktiviti mereka, dan jangka masa lawatan. Data kuantitatif telah diuji menggunakan ujian Chi-square. Kedua-dua kaedah kualitatif dan kuantitatif dianalisis dan ditafsirkan secara berasingan. Banyak faktor seperti saiz persampelan, masa, kekerapan penggunaan, dan pilihan aktiviti didapati berfungsi-sama dengan ciri-ciri pengunjung dalam menentukan agihan dan kesesakan pengunjung-pengunjung di lorong-lorong taman tersebut. Hasil keputusan kuantitatif dan kualitatif telah menunjukkan bahawa aktiviti-aktiviti yang paling tinggi digunakan adalah aktiviti rekreasi atau aktiviti perkhidmatan berdasarkan lokasinya. Aktiviti-aktiviti mendapat kepentingan mengikut lokasi mereka dan kawasan ini mendapat kepentingan daripada aktiviti di dalamnya. Tingkah laku pergerakan yang tidak biasa dikalangan pengunjung taman yang tidak teratur adalah sama ada untuk memendekkan masa atau untuk mengelakkan kesesakan atau semacam sikap yang tidak peduli oleh pengunjung terhadap kepentingan menjaga kemudahan-kemudahan yang ada ditaman. Ciri-ciri demografi pengunjung telah membantu mengenal pasti aktiviti-aktiviti terpenting di taman, jalan-jalan, kawasan-kawasan yang paling sibuk, dan corak-corak pergerakan yang paling lazim. Ini juga membantu menentukan tingkah laku rawak para pengunjung dan masa lawatan mereka.

THE IMPACT OF DEMOGRAPHIC CHARACTERISTICS ON VISITORS’ MOVEMENT BEHAVIOUR INSIDE AN URBAN PUBLIC PARK

ABSTRACT

The visitors’ movement behaviour inside parks is represented in multiple expressions from different perspectives and influential factors. The lack of knowledge about the role of the demographic characteristics of urban public park visitors in the selection of activities inside the park and in determining the most frequent movement pattern and the most frequently used tracks lead to improper zoning of the area. As a result, there will be both congested, neglected areas, and separation and isolation among the park visitors. Congestions and overuse inside urban public parks may adversely affect the natural environment inside the park. The conflict between park visitors might affect their recreational plans, including their choices of activities, paths, and time spent inside the park. The main aim of this study is to investigate the visitors’ movement behaviour inside an urban public park. To achieve the aim, this study has sub-objectives: 1) To identify the demographic characteristics of urban public park visitors, the activities undertaken, and time spent inside the park. 2) To identify the congested and neglected paths based on the visitors’ selection and random movements inside the park. 3) To examine the relationship between the demographic characteristics of an urban public park visitors, paths, and movement patterns inside the park. 4) To forward recommendations regarding the visitors’ movement behaviour, which helps conserve the park environment and create a positive recreation experience. The study was conducted at Youth Park in Penang Island, Malaysia (called Taman Perbandaran Pulau Pinang-Malaysia). A mixed methodology is used to collect data, whereby qualitative and

quantitative data were collected simultaneously. Qualitatively, multiple methods were used with 154 groups of visitors to elicit different information about their movement patterns, their choices of paths and routes, congestion, and random movement, which has been explored through observation and map tracing. The visitors' movement pattern is explored through drawing methods and analyzed using the GIS program. Quantitatively, a survey questionnaire was used to identify visitors' demographic characteristics, their choices of activities, and the duration of the visit. Quantitative data were tested using the Chi-square test. Both qualitative and quantitative methods were analyzed and interpreted separately. Many factors like sample size, time, frequency of use, and the choice of activities work together with visitors' characteristics to determine the distribution and congestion of visitors in the park paths. Quantitative and qualitative results indicated that the highly used activities included either recreational or service activities or because of its location. Activities gained importance according to their location and the region gained importance from the activity inside it. Irregular movement behaviour of park visitors is either to shorten the time or to avoid congestion or a kind of indifference by visitors to the importance of preserving park facilities. The demographic characteristics of the visitors helped identify the most important activities in the park, the paths, the busiest areas, and the most common movement patterns. It also helped determine the random behaviour of visitors and the time of the visit.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The topic of the study is introduced in this chapter. It presents and discusses the research background, the statement of the problem, the research questions, in addition to the aim and objectives of the study. Also, research methodology, the scope, limitations, research gap and significance of the present study are presented in the chapter. The chapter concludes with the organization of the thesis.

1.2 Research Background

Parks are important indicators in measuring urban life's quality. In this regard, Loukaitou-Sideris (1995) pointed out that urban parks are regarded as valuable assets for the public due to several reasons, particularly because they can satisfy the recreational and leisure, as well as social needs of the urban residents. Moreover, urban parks can provide visual, as well as psychological relief in the areas that are highly dense with people. Parks can affect the lifestyle of park users because they provide venues for physical activities, social communication, and recovery from psychological stress.

Urban parks represent the most historic features that are found in cities. Springgate (2001) indicated that parks represent peaceful and tranquil spaces. These spaces are considered beautiful and intrinsically attractive to people. Urban parks, historically, originated from public spaces. These spaces were utilized as lands for grazing inside cities and/or towns. In the 17th century in Western Europe and New England in the US, evidence revealed that people used to provide nearby lands in

towns and cities, as well as villages to be used for grazing livestock. They used to keep animals before they sold them, and they used to make use of these lands in their villages or towns (Jellicoe & Jellicoe, 1975; Newton, 1971). Such grazing lands have become useful spaces over time in cities and towns because people used these lands for various purposes. The urban park's modern concept in the West emerged throughout the well-known Industrial Revolution in the early 19th century. Planners, then, recognized that these urban parks represented important features, which can enhance the city life's quality because it rapidly declined throughout the industrialization age. Parks have, therefore, become useful places for people in escaping from industrial cities' stressful lifestyles. The idea of urban parks has, thus, spread throughout the US, England, as well as mainland Europe. Therefore, Swedish cities, as well as cities in Denmark, in addition to Holland have developed useful urban parks to improve the cities' quality (Jellicoe & Jellicoe, 1975). Apart from fast industrialization, mass migration is another reason for stimulating urban parks' growth. The urban spaces that are crowded because of the massive people's influx considerably degraded urban life's quality. Planners, thus, started to realize that urban parks are important places, which can boost urban life's tranquillity, as well as comfort. This can be done by providing spaces for people to escape the uncleanliness, as well as stress, which characterizes people's everyday routine. Parks, therefore, serve people because they provide recreation, as well as leisure spaces. Urban parks were developed at the public expense in the late 19th century (Yuen, 1996) because of the working population's social reform in Britain, which led to early legislation that provided open spaces for people in cities, as well as towns. Urban parks have, therefore, transformed American, as well as European cities since then. These parks not only improved and redecored people's urban environment

but also became significant structural components that are related to shaping the urban form (Yuen, 1996).

In the late 19th century and throughout colonization, the concept of an urban park was introduced into Asia by the Europeans. Cities, including Manila and Hong Kong, as well as Shanghai and Singapore, in addition to Kuala Lumpur, had established urban parks by the early 20th century. In the wake of World War II, when Singapore and Malaysia, as well as Indonesia and China, in addition to the Philippines were independent, urban parks became a necessity in cities that expanded and the population rapidly increased (Yuen, 1996). Therefore, people needed more urban spaces for their health, as well as their recreation; they needed better planning for towns and cities. Governments, therefore, started developing new parks or redeveloping old parks to fulfil people's needs in many Eastern countries. Today, these urban parks have become very significant assets to Singapore and Hong Kong, as well as Taiwan. These countries are tremendously urbanized, and they are industrialized countries as well. The demand for such urban parks has increased in Malaysia and Thailand, as well as Indonesia, in addition to the Philippines. These countries have become more and more urbanized, and they are highly industrialized. They have also experienced demographic changes since the 1990s. Urban parks are regarded as assets to cities, towns, and people by providing enough spaces for people's leisure, their passive, as well as their active recreation. Historically speaking, it was revealed that urban parks' use has changed to fulfil societies and cities' needs and requirements. Changes in the people's lifestyle, for instance, have increased the concern for their health, as well as their fitness, which means people would visit urban parks to do various exercises. The demand for various activities and recreation areas would, therefore, affect the way parks are planned and designed.

Also, research about social behaviour provides clues for better planning and designing the urban park. Since urban parks were established in Western countries, one primary concern of social scientists and landscape architects, as well as park advocates revolves around gauging social behaviour's impact and using relevant information to help in building more efficient parks. It is also essential to understand who is doing what, when, where, and why to design more popular and efficient urban parks.

Generally, recent studies about urban public parks have focused on the visitor's movement behaviour inside those parks. The visitors' movement patterns inside urban parks are represented in multiple expressions from different perspectives and different influential factors, including the type and function of the visited place, the aim of the visit, the visitors' background, spatial layout, accessibility, etc.

To analyze the park visitor's movement helps in characterizing the aggregated people's flow in the park. It can also provide valuable insights into the preferences of the visitors and users' interactions with the surrounding environment (Orellana et al., 2012).

Monitoring, as well as analyzing the flow of visitors in areas that provide natural recreation is important for understanding the behaviour of visitors. This is necessary for achieving effective management, which meets conservation, as well as recreational requirements (Mckercher & Lau, 2008; Muhar et al., 2002). To grasp these requirements is essential and, therefore, there is a need for detailed information on the area's usage, as well as preferences of various target groups (Chiesura, 2004). To analyze the visitors' spatial behaviour by relating various uses, as well as

activities to various places, in addition to landscape configurations provide useful insights into the park visitors' preferences and their purposes (Goličnik & Ward Thompson, 2010). One important aspect of the visitors' spatial behaviour in the recreational areas involves the visitors' movement in these areas (i.e., intra-site flow). Focusing on the impact of visitors' demographic characteristics on the movement's behavioural pattern results in securing the needs of every visitor according to his/her wishes and abilities that achieve the aim of the visit. Monitoring people's movement while visiting the recreational area helps in identifying certain places that visitors visit the most or the least and the time spent in these places, in addition to the most preferable attractions for various target groups.

Realizing such preferences, the market can be segmented by managers. Also, more diverse, as well as focused options can be provided to satisfy specific visitors' wishes (Holyoak & Carson, 2009). This movement behaviour comes in many properties, including distance, time, frequency, speed, and type.

This study aims at investigating the demographic characteristics of urban public park visitors. It aims at identifying the key role of such characteristics in determining the visitors' choices of activities, choices of paths leading to those activities, congestion, the intensity of using those paths, and visitors' movement patterns inside the park. This study, therefore, aims to provide solutions, as well as useful suggestions for urban planners in terms of conserving these parks, provide fun opportunities, entertainment, and satisfaction for the park visitors, and achieve the goal of urban parks in the communication between the city residents and the park visitors.

1.3 Problem Statement

The increasing need for establishing the urban park has been understood for a long time. In the past decade, such need was discussed, and it was widely explored. As emphasized by Christiansen and Conner (2001) and McRobie (2000), the public park is designed for people's recreation. It also provides enormous benefits for their community by boosting people's health and their well-being, in addition to improving their enjoyment of the surrounding local environment.

Similarly, leisure benefits can cover people's physical health and their psychosocial well-being, as well as their self-actualization, in addition to their spirituality. Benefits can also include people's self-identity and family bonding, as well as child development, in addition to developing their social skills and environmental education (Veal et al., 2015).

Visits to parks, as well as protected areas, will continuously and considerably increase, which will, in turn, increase the potential risks that are resulted from the human impact on nature, as well as cultural resources in the parks. The adverse impact on the park does not happen because of people's visitation, but it happens because of utilization amount, distribution in the parks, and seasonal use, in addition to specific leisure activities (Ziener, 2002). Manning and Cormier (1980) observed that facilities, as well as services in urban parks, might be unused throughout most of the year. They are used for short periods only and their capacity increases during the parks' peak loads. They observed that this periodic peaking of recreational use does not increase the potentials for conflicts, but they cause management problems in relation to the personnel scheduling.

The natural areas' excessive use can significantly inflict direct, as well as indirect negative effects, including environmental degradation, in addition to diminishing the quality of the people's recreational experiences (Lynn & Brown, 2003). In general, seasonal vacations, holidays, and events might cause congestions and overuse inside urban public parks. This may result in new behaviours and patterns of the park visitors and users that are completely different from their nature during their normal visits, which adversely affect the natural environment of the park and people's experience as well.

In addition to the impacts on the area's ecological quality by causing a disturbance by people, the recreational quality may be influenced by crowdedness and noise, as well as differences in people's recreational behaviour when it becomes clear that park paths are not enough and harmonious with the distribution of activities and people's desires in certain situations, for example, where bikers can meet walkers in the park (Ligtenberg et al., 2008). Understanding the mobility of users and visitors to the park plays a fundamental role in the administration and design of their destinations, planning of on-site movement avoiding conflict, and marketing of attractions (Zheng et al., 2017).

Congestions might also cause a conflict between people who visit the same activity or who use the same route to get to different destinations (R. M. Itami & Gimblett, 2001). This might cause a delay in their arrival at their destination or having to change their plan. As a result, both individuals and groups might resort to another activity or double their distance using multiple routes, or they might trample on the park grass and plantations to shorten the way to their destination.

Focus on the flow of users and visitors in natural recreational areas is key to understanding the visitors' behaviour, which is, in turn, needed for effective management that meets both park maintenance and recreational requirements (Mckercher & Lau, 2008; Muhar et al., 2002).

Analyzing the spatial behaviour of visitors by relating different uses and activities to different places and landscape configurations can provide insights into their preferences and purposes (Goličnik & Ward Thompson, 2010). One of the most important aspects of the spatial behaviour of visitors in recreational areas is their movement inside the area (intra-site flow). Monitoring the movement of people during their visits to a recreational area can help to identify which places they visit most or least, how much time they spend in each place, and which kind of attractions different target groups prefer. The movement of people during their visits to the park, the places and the activities they choose, the time they spend, and their reaction to other visitors and congestion, all that reflect their behaviour inside the park which comes from their cultural attributes as well as their demographic characteristics. Knowing those preferences, managers can assess the carrying capacity in sensitive areas, segment the market and offer more diverse and focused options, adapted to the wishes of specific groups of visitors (Holyoak & Carson, 2009). Monitoring and analyzing the movement of visitors and area usage can also provide information about potential crowding and conflicts between different groups (Manning & Valliere, 2001; Ostermann & Schrenk, 2009). By understanding visitor's movement behaviour in urban public parks, we provide proposals and solutions for park designers, planners, and managers that help them to prevent congestion and random distribution of visitors. This will improve and maintain the efficiency of the park and provide a better leisure experience for visitors.

A major challenge that faces park managers is the park users' diversity, who compete for similar resources and the need for balancing multiple objectives while maintaining positive tourism experiences to achieve the real purpose of public urban parks, i.e., harmony and social communication among park visitors with diversity and cultural differences. To address the park visitors' needs, a better understanding of their behaviour is vital. Traditionally, visitors' surveys and simple traffic counts, as well as anecdotal evidence were the main sources of information to assess their experiences and crowding, as well as their movement patterns, in addition to the resulting interactions. Because the number of recreations increases, the park management's decisions have become more and more complex. The diversity of the visitors' types would create management scenarios, which are ever more difficult to be managed (R. M. Itami & Gimblett, 2001).

Today, the eco-tourists' characteristics, as well as their motivations can be more understood compared to their characteristics 10 years ago. Nevertheless, an evident lack of empirical research on such park visitors' motivations still exists (Holden & Sparrowhawk, 2002).

Monitoring the people's movement while visiting the recreational areas can help in identifying specific places they like to visit the most or places they visit the least, as well as the time spent at these places and the types of attractions that are preferred by various target groups, how planners can use this information to strengthen social communication among visitors and strengthen the unity of the diverse society. Both the park's quantity, as well as its quality, should become the most important goal for cities (Van der Merwe & Saayman, 2002). The relationship of the people with the park is different according to some factors like socio-economic

and gender, as well as types of activities, in addition to park facilities. By recognizing the preferences of visitors, this will help the park managers to segment markets and provide more options that are diverse by fulfilling specific visitors' needs, as well as their requirements (Holyoak & Carson, 2009).

People usually visit parks after they had already planned how to spend their time there. Having identified the activities that they would carry out whether the visitor is alone or in the form of a group, the park visit should satisfy all the planned and desired activities by individuals to spend enough time for that and this includes children, adolescents, adults, and elderly people, as well as visitors from different races and educational backgrounds. However, in some cases, the visit does not relatively match with what has been planned by visitors, who feel disappointed, especially for first-time visitors (Fodness, 1994; Kozak, 2001; Yoon & Uysal, 2005).

The visitors' movement behaviour, who look for solitude, as well as relaxation, might differ from those, who look for specific social activities like playing or picnicking. Therefore, investigating these aspects can help in understanding how different visitors can experience crowding. Numerous characteristics of the urban parks are linked to the physical activities' patterns. However, untangling the relationships to enhance the levels of physical activities involves methodological challenges (Meng et al., 2008).

The movement behaviour of visitors varies according to their choice of activities, which in turn differ according to their characteristics. To understand these requirements, we need detailed information about area usage and the preferences of different target groups according to their profiles. That is why it is important to study

the visitors' movement behaviour according to their demographic characteristics (Chiesura, 2004; Orellana et al., 2012).

The characteristics, behaviours, and preferences of urban-park users are seldom analyzed to improve park planning and management. A study tried to address the research gap using Hong Kong case studies, aiming to establish socio-demographic profiles of park users; evaluate their visit-related preferences; examine the effect of socio-demographic variables on visit-related preferences, and to apply the findings to improve urban parks. The findings allowed the formulation of a comprehensive, socially relevant, and community-sensitive strategy to improve urban parks. Applicability of the findings highlighted the pertinence of objective research data to match parks with the leisure and recreational needs of urban residents (Mak & Jim, 2019).

In another study on Taman Tasik Seremban in Malaysia, we can find that the most preferred dimension or activities are related to families and the least preferred activity is exploration. The findings suggest that the design of an urban park in Malaysian cities, particularly in Seremban, should focus more on providing facilities to the family and social activities rather than individual facilities (Maulan, 2015).

The lack of knowledge about the role of the demographic characteristics of the urban public parks' visitors in the selection of activities inside the park and in determining the most frequent movement pattern and the most frequently used tracks will eventually lead to incorrect zoning of the area. This can be in terms of the importance hierarchy, diversity, and priority of activities according to the most influential users' characteristics and the relationship between these activities. As a result, there will be both congested and neglected areas, as well as separation and

isolation among the park visitors. The statement of the problem of this study can, therefore, be addressed from three related aspects as summarized in Figure 1.1 and Table 1.1.

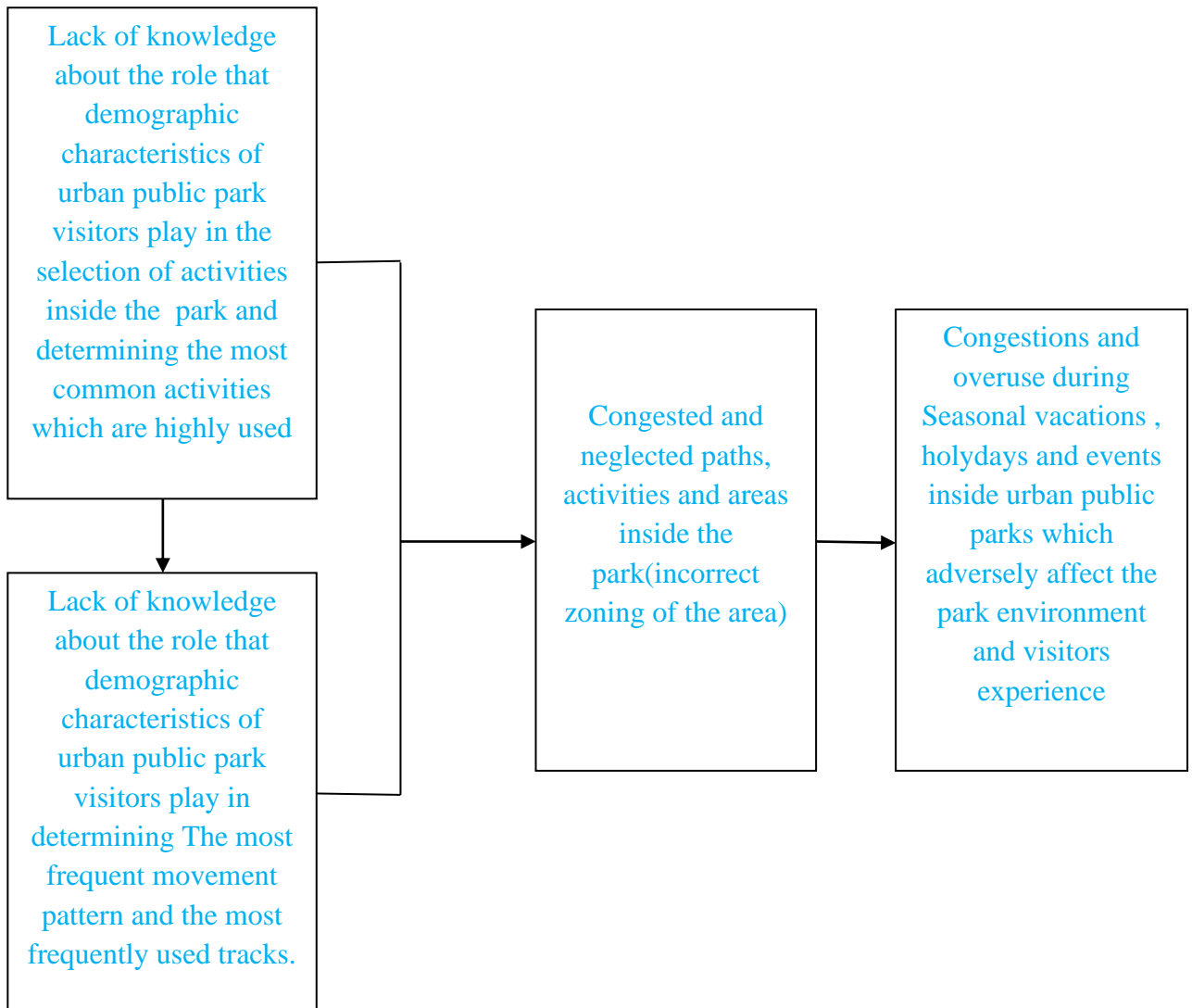


Figure 1.1 Summary of the research problem

Table 1.1 Summary of the three related aspects of the study problem

Problem Aspect	Problem	Reference
Aspect 1	Congestions and overuse inside urban public parks during seasonal vacations, holidays, and events may adversely affect the natural environment inside the park.	(Ziener, 2002) (Manning & Cormier, 1980) (Farrell & Marion, 2008) (Lynn & Brown, 2003)
Aspect 2	The conflict between people inside the park might affect their recreational plan, including their choices of activities, paths, and time spent inside the park.	(Ligtenberg et al., 2008) (R. M. Itami & Gimblett, 2001) (Zheng et al., 2017)
Aspect 3	Lack of knowledge about the role that demographic characteristics of urban public park visitors and users play in the selection of activities and paths inside the park and the most frequently used tracks lead to incorrect zoning of the area regarding the importance hierarchy, diversity, and priority of activities based on the most influential users' characteristics and the relationship between these activities. Congested and neglected areas, as well as separation and isolation among park visitors, can arise.	(R. M. Itami & Gimblett, 2001)(Holden & Sparrowhawk, 2002) (Van der Merwe & Saayman, 2002) (Holyoak & Carson, 2009) (Fodness, 1994) (Yoon & Uysal, 2005) (Kozak, 2001) (Meng et al., 2008) (Mak & Jim, 2019) (Orellana et al., 2012) (Maulan, 2015)

1.4 Research Questions

- 1) What are the demographic characteristics of urban public park visitors and the activities undertaken inside the park?
- 2) How do demographic characteristics of urban public park visitors affect the choice of activities and amount of time spent inside the park?
- 3) Where are the most congested and neglected paths and random movement patterns that visitors make inside urban public parks to accomplish the activities they choose?
- 4) What are the relationships between the demographic characteristics of urban public park visitors and congestion rates, congested and neglected paths, and random movement patterns inside the park?

- 5) How could learning visitors' movement behaviour within the park help to preserve the park environment and achieve a positive recreation experience?

1.5 Aim and Objectives of the Study

1.5.1 Aim of the Study

The present study mainly aims at investigating the visitors' movement behaviour and congestion inside an urban public park according to their demographic characteristics.

1.5.2 Research Objectives

The present study aims at achieving these objectives that are related to the aim of the present study.

- 1) To identify the demographic characteristics of urban public park visitors, the activities undertaken, and time spends inside the park.
- 2) To identify the congested and neglected paths based on the activities undertaken, and time spent by visitors while inside the park.
- 3) To examine the relationship between the demographic characteristics of urban public park visitors and congested and neglected paths and movement patterns inside the park.

1.6 Research Methodology

This study investigates the demographic characteristics that influence the movement behaviour of people inside an urban public park during their visit. Therefore, the study focuses on urban public park users and visitors as its main

respondents. The reason for choosing urban public parks to be investigated in this study is that these parks are essential components of a healthy and vibrant urban community, where people can share spaces open to the park users. Urban parks aim to provide a public sanctuary from the urban hustle and fulfil their visitors' and users' needs and preferences. The park users were, therefore, chosen as the respondents of this study so that a deeper understanding of their behaviour inside the park is obtained. Regarding the data collection methods, observation, photography, map tracing, and survey, which includes the visitors' group were utilized to elicit data on their demographic characteristics and the activities that they practice inside the park. The survey questionnaire to collect quantitative data from people inside the park. Methodologically speaking, four data collection methods were implemented to investigate the park visitors' demographic characteristics, their choice of activities, choice of paths, movement patterns, and congestions. The collected qualitative data based on the qualitative approaches (observation and photography) were analyzed using descriptive content analysis, and for the map tracing method as we used GIS analysis concerning the selection of paths, congestion rates, random behaviour, and movement pattern according to the visitors' demographics. The questionnaire survey with the park visitors (as the quantitative approach) was analyzed using the SPSS software to identify the visitors' characteristics, which considerably impact their choice of activities and duration of the visit.

First, data on the visitors' characteristics, activities preferences, and time were gathered using a survey questionnaire with the visitors themselves. The collected data were keyed in Excel tables for both statistical and GIS programs. Then, the data were analyzed inferentially using the Chi-square test to identify the relationship between influential characteristics and the visitors' choices of activities.

The data collected from the map tracing were keyed in AUTOCAD and converted from AutoCAD files into shapefiles to prepare them for the GIS program in which data on paths and activities that were chosen by the park visitors were analyzed with congestion rates. The results obtained from the quantitative research analysis SPSS showed that five important demographic characteristics exerted the greatest influence on the visitors' choices of activities. These five characteristics were keyed together with the movement pattern maps in excel file forms to analyze the relationship between demographic characteristics of urban public park visitors and the amount of use of paths and activities inside the park first, then with their movement patterns inside the park. Observation and photography were used to support the visitors' random movement analysis during high congestion and its effect on the park environment. Finally, all the data that were gathered from the qualitative and quantitative approaches were corroborated to suggest appropriate solutions regarding the relationship between the visitors' movement behaviour and their demographic characteristics so that the park environment is conserved and positive, as well as useful experiences for visitors are provided inside the park.

1.7 Scope of the Study

This study investigates the movement behaviour of people inside an urban public park based on their demographic characteristics. The Youth Park, which represents an urban public park in Penang Island, Malaysia, was chosen to be investigated in this study other than the urban public park in Penang Island for several reasons related to the research problem, including the diversity of activities inside the park and their abundance in a manner that allows a wide and varied group

of people to visit it, which provides an opportunity to cover many of the demographic characteristics of the visitors and users in this study.

The diversity of corridors in terms of length and width of the path, and the distribution of activities along these corridors, noting the burden on them and congestion within the park during holidays and vacations. In contrast, there are paths and semi-abandoned areas inside the park. All that fits into the research problems which are confirmed in the Youth Park through the presence of many paths and newly paved areas, that have clearly been developed on-site outside the design and basic context of the park and placed next to the original paths with different materials, which indicates the existence of urgent problems in the movement of visitors and users required it to be solved instantly. The movement patterns of people inside this urban public park explain the users and visitors' genuine way of thinking and behaviour, their plans and preferences, as well as their choices and decisions during normal days or at peak congestions. The demographic characteristics of public park users and visitors (the independent variables) are expected to influence their choices of activities (the dependent variables), which, in turn, affect their choices of paths and their movement patterns (the dependent variables). Therefore, the demographic characteristics (IVs) are expected to affect the visitors' choices of paths and their movement patterns (DVs). It is assumed that the park visitors' actions and their movement behaviour inside the park are affected by congestions in some points or areas that are full of people. In contrast, it is assumed that there are empty spaces that are visited only by a few numbers of people.

1.8 Research Gap

The research gap is that there are many reports and research related to urban public parks that dealt with the theme of the park in terms of its positive impact on urban environment and maintenance, the needs and satisfaction of visitors, their behaviour within the park, the benefits of outdoor sports and the role of modern technologies in monitoring visitor movement, the effect of crowding on visitors' experiences, statistics related to the demographic characteristics of visitors, accessibility to the park and activities inside it, the general context of the park and its design, visitor spending, safety inside the park, and nightly use of parks.

However, none of these research sheds light on the movement behaviour of visitors and the congestion within the park in terms of linking them to the demographic characteristics of the visitors and how those characteristics affect visitors' choice of the activity they practice within the park, which in turn determines their distribution, spread, and their choice of movement paths, places of gathering and crowding, abandoned areas inside the park, and the effect of all this on the park environment and the proposed solutions in this regard. Hence, this study came to bridge this research gap and add a new contribution to the issue of urban public parks.

1.9 Significance of the Study

Since the foundation of the urban park in Western countries, the main concern of social scientists and landscape architects, as well as park advocates, have always revolved around gauging the effect of the visitor's social behaviour and employing

relevant information to assist in designing better and more efficient parks (Yuen, 1996).

The planners and designers of urban parks ask for further research into how people use urban parks, how they use park paths, nodes, playgrounds, and other components inside the park. The visitors' movement patterns for those, who look for solitude, as well as relaxation, might differ compared to the visitors, who look for specific social activities like playing and picnicking, as well as studying. This helps us in understanding how various groups of visitors can experience crowding. This also helps in providing information for the conservation management to evaluate the carrying capacity in the park's sensitive areas and the best ways for the distribution of visitors.

This study, therefore, emphasizes the impact of the public park users' demographic characteristics on their movement behaviour. Such an impact should be considered by the park designers and planners to ensure that the park visitors have positive and useful experiences and that the public park environment is preserved as well. This study is significant research because it aims to tackle the existing problem and address the gap in previous research. The significance of the study can be summarized as follows:

- i. This study contributes to the existing knowledge about the demographic characteristics of urban public parks' visitors that affect their choices of activities, paths, and movement behaviour inside the park.
- ii. This study used descriptive statistical analysis, which emphasizes the importance of the following demographic characteristics (age and gender, as well as ethnicity, in addition to the marital status and the education level, occupation, income,

nationality, and the visitors' group) regarding the visitors' choices of activities inside the park.

- iii. Based on the aspects of the movement behaviour, choice of paths, visitors' congestion, and intensity of use, the study investigates the congestion and distribution of the visitors according to their choices of activities based on qualitative analysis. The study investigates the movement patterns according to the users' demographic characteristics and identifies the amount of use of paths and activities inside the park based on the qualitative method of GIS analysis to help park planners and managers avoid congestion problems, conflict, overuse, seamless, and isolated areas inside the park.

1.10 Organization of the Thesis

This thesis is comprised of six chapters. Chapter 1 is an introduction to the research background and the statement of the problem. The chapter provides the research questions and the main aim of the present study, in addition to its objectives in response to addressing the research problem. Also, the scope of the present study and its limitations, the significance, and the research design are provided in this chapter. This chapter concludes with the organization of the thesis.

Chapter 2 defines urban public parks, identifies the characteristics of urban park users, and highlights the relationship between the demographic characteristics of the park visitors and their choices of activities within the park. The chapter reviews the theories that are related to the visitors' movement patterns inside parks and their relationship with the visitors' choices of activities. This chapter comprehensively discusses the role of the demographic characteristics of urban park visitors in their movement patterns inside the park. It defines the park's congestions

and bottlenecks and their effect on the visitors' movement patterns and park Maintenance.

Chapter 3 presents the research methodology, which is adopted to investigate the park visitors. It explains the measurement strategies which are designed to achieve the objectives of the study and to designate the visitors' demographic characteristics, their choices of activities, their choices of paths, their movement patterns, and congestions. It also presents the study area and discusses the methods, which are employed in the analysis of the qualitative, as well as the quantitative data of this study. The methods of analysis include descriptive analysis, content analysis, the GIS analysis, and the SPSS statistical measurement.

Chapter 4 presents and discusses the results of data analysis that were collected in the survey on the visitors of Youth Park. The chapter starts with testing a sample profile of respondents, then the activities they planned to practice during the visit, and the time they spend inside the park using SPSS analysis to fulfil the first research objective.

Chapter 5 presents and discusses the qualitative results, involving the most congested and neglected paths, the park visitors' activities, and the most influential demographic characteristics of urban park users regarding their choices of activities and paths, their movement patterns, congestion, the visitors' random movement behaviour, and the movement behaviour of the isolated visitors inside the park.

Chapter 6 provides and discusses the findings of the study, as well as the theoretical and design implications. The chapter discusses the most used and neglected paths and activities, the isolated and separated areas, the visitors' random

movement behaviour concerning their demographic characteristics. It also explains the effect of these components on the park environment and the park visitors' experiences. Furthermore, the chapter provides recommendations regarding the ideal urban public parks concerning the park visitors' movement behaviour according to their demographic characteristics and recommendations for further studies are provided about the visitors' movement behaviour inside urban public parks.

1.11 Summary

This chapter introduces the core and direction of the research background. The research relates to the movement behaviour of urban public park visitors which has strong links with their demographic characteristics and choice of activities. The research problem is related to literature gaps. The research questions are narrowed to answer the objectives and finally, the scope and significance of the research are clarified. In the next chapter, the related literature to the concepts will be reviewed to answer the research questions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents general and basic definitions of urban public parks, the demographic characteristics of visitors to urban public parks, their choice of activities during the visit, and all the practical applications, and relations between them in the literature with explanations on how the researchers dealt with them. This chapter also reviews the concept of congestion within the parks in the literature and its main causes and results. Finally, it gives an overview of urban public parks in Malaysia.

2.2 Urban Public Parks Definition

The term park has been mentioned repeatedly in the literature. The increasing need for establishing urban parks has been understood for a long time, and over the previous decade, it has been widely discussed.

Open spaces are an outlet for the citizens, through which many city elements are seen highlighting both planning patterns and architectural styles. Providing such places will help people to visualize the horizontal and vertical levels of the city. That is why public places like parks, streets, and squares, have become the cities' eyes with higher urban growth rates. Public recreational spaces play a key role in the life of urban residents who cannot go to private amenities (Eisenman, 2013).

Parks can vary in their sizes, designs, ornamental embellishments, planting, facilities, and maintenance. The parks' constitutive elements and trees, their grass and pathways, benches, ponds, and fountains, their statues, gardens, playgrounds, and sporting facilities reflect the nature-making varied ideologies. Historically speaking, parks were perfect as salubrious spaces and social interaction places (Eisenman, 2013). '...as we produce naturally, so do we produce social relations' (Katz & Kirby, 1991).

Considering the importance of public parks and their social, cultural, and environmental impact on the population and the city as a whole, providing these places and maintaining their facilities has become one of the most important responsibilities of the governments. That's why parks are considered places of tutelage, the cultural identity inscription, and memory, tourists' destinations, as well as anchors of property development. All governments are involved in the design of parks and their management (Byrne & Wolch, 2009).

In addition to all the above, public parks are considered an indication of the well-being and quality of life of the population. Green spaces inside and around cities provide good opportunities for various leisure activities like relaxing, sporting, enjoying nature, and playing facilities for children. Thus, they essentially contribute to the urban residents' quality of life (Page et al., 1994).

The National Recreation and Park Association (NRPA) is a leading non-profit organization dedicated to the advancement of public parks, recreation, and conservation. It was formed on August 14, 1965, when five organizations, the National Recreation Association (NRA), American Institute of Park Executives (AIPE), American Recreation Society (ARS), the National Conference on State